Annual Audit Plan
FY 2007

National Science Foundation
Office of Inspector General
September 27, 2006

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AUTHORIZATION

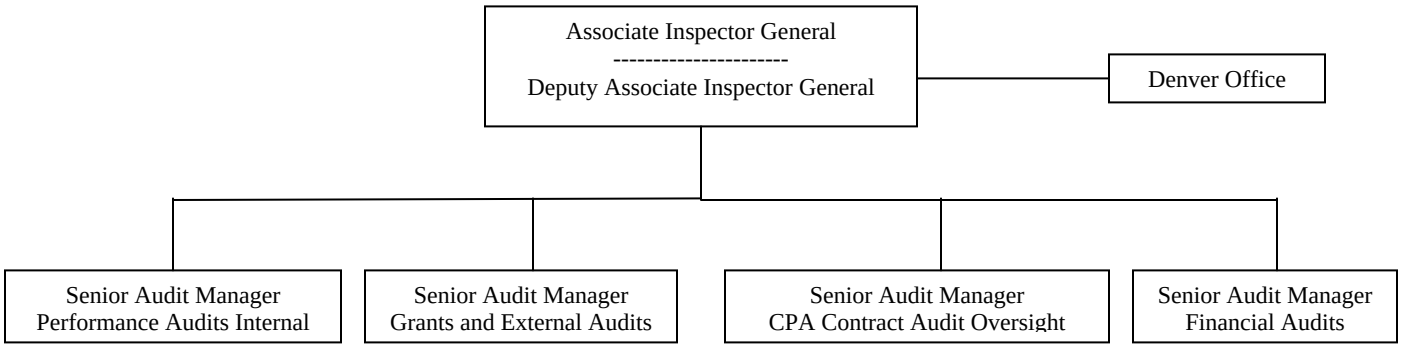
The Inspector General Act, as amended in 1988, authorizes an Office Inspector General (OIG) for the National Science Foundation (NSF). The OIG is independent of NSF and reports directly to Congress and the National Science Board (NSB). By statute the OIG conducts and supervises independent audits and investigations relating to agency programs and operations, and recommends policies that promote effectiveness, and efficiency, and prevent and detect fraud and abuse in such programs and operations.

OIG MISSION AND FUNCTION

Consistent with its statutory mandate and operational mission, the OIG performs an oversight role and does not engage in program operations. Its work is divided into two functional areas: investigations, which address allegations of serious wrongdoing, such as plagiarism, and audits and reviews, which assess the functionality of systems, determine compliance with financial and compliance standards, and identify ways to improve systems. In each area, the OIG strives to focus on substantive matters, and work objectively and cooperatively without compromising its independence. The functional units within OIG also collaborate. For example, auditors may examine alleged financial improprieties at early stages of investigations; and auditors and investigators may work in teams on compliance issues. OIG scientists and auditors collaborate on performance reviews, and auditors, investigators and information technology staff work together on responses to alleged computer-security breaches.

ORGANIZATION AND FUNCTION OF THE OFFICE OF AUDIT

The Office of Audit, which reviews agency operations, as well as grants, contracts, and cooperative agreements funded by NSF, is comprised of an experienced audit and administrative staff led by the Associate Inspector General for Audit, the Deputy Associate Inspector General for Audit, and four Senior Audit Managers, as shown in the chart below:



Performance audits are reviews of specific NSF programs or operations. These audits provide NSF management with independent and objective assessments of whether desired program results and objectives are achieved effectively, efficiently, and in accordance with applicable laws, regulations, policies, or procedures. The audits are intended to assist NSF management in improving its controls and business practices and to identify and manage program risks at an early stage.

Grant audits ascertain whether NSF awardees have adequate internal controls to administer, account for, and monitor NSF awards and to ensure compliance with NSF and Federal requirements. Grant audits determine whether costs claimed are allowable, reasonable, and properly allocated. Furthermore, grant audits seek to identify practices at NSF and awardee institutions that may be modified so that funds can be used more effectively and effectively or for higher priority purposes. The Office of Audit is also responsible for annual audits of NSF's financial statements, which includes evaluating the agency's controls over financial reporting and information system security.

Contract audits include preaward, active-award, and closeout audits of planned, current, or completed contract awards respectively. Preaward contract audits determine if prospective contractors have adequate systems to manage and account for NSF funds. Active-contract audits review whether incurred costs are allowable under the terms and conditions of the contract, as well as the adequacy of the accounting systems used to claim the costs. Closeout audits determine if costs incurred on expired contracts are allowable and whether the contractors have adequate internal controls to manage NSF funds. Because contractors often receive multiple NSF contracts, all three types of audits may be conducted simultaneously or sequentially for one contractor.

THE AUDIT PROCESS

The audit process begins when the Office of Audit initiates a review planned by the OIG or requested by NSF management. Maintaining NSF management's involvement throughout the process ensures that the OIG adds value to NSF's operations. The Office strives to maintain an open channel of communication with NSF management to keep NSF informed of the audit progress during each phase of the review. The Office conducts all of its audits in accordance with the Comptroller General's *Government Auditing Standards,* which are intended to ensure the integrity and competency of the audit process and the quality of the audit report. The steps in a typical audit are:

- **Engagement Letter** - Notify awardee and/or NSF management of the OIG's intention to perform an audit.

- **Survey** - Obtain an overall understanding of the entity, program or operation under audit in order to clarify audit objectives and develop a work plan.

- **Field Work** - Collect and analyze information to identify any appropriate audit findings. Review findings with auditee.

- **Exit Conference** - Inform awardee and/or NSF management of the results of the audit.

- **Reporting** - Communicate conclusions and recommendations to NSF and/or awardee management, the NSB and Congress.

Who Performs Audits?

OIG Staff

In conducting its audits, the Office of Audit draws upon a diverse staff with various educational and professional backgrounds. Professional staff include auditors, attorneys, management analysts, scientists, investigators, and computer specialists. The OIG also relies on staff located in its Denver Office for expert assistance in key functional areas and to provide increased economy and efficiency based on the geographic diversity this location provides.

Independent Public Accountants

The OIG supplements its in-house staff with independent public accounting firms under contract to the office. The firms provide the expertise necessary to accomplish the OIG's many varied and unique audit projects. The OIG currently relies on independent public accounting firms to perform the annual audit of NSF's financial statements as required by the Chief Financial Officers Act, as well as audits of recipients of NSF awards.

A-133 Audits

Non-Federal entities that expend $500,000 or more in a year in Federal awards are required, under the Single Audit Act of 1984, as amended, to have a single or program-specific audit conducted for that year. Office of Management and Budget (OMB) Circular A-133, *Audits of States, Local Governments and Non-Profit Organizations*, constitutes the guidance prescribed under the Act and sets forth standards for obtaining consistency and uniformity among Federal agencies for the audit of states, local governments, and non-profit organizations expending Federal awards. Reports prepared by state auditors or independent public accountants in accordance with this Circular are referred to as A-133 or Single Audits and address an institution's financial statements and compliance with award conditions. The purpose of these audits is to provide Federal agencies with information on how government funds are managed and spent.

The Single Audit Act requires that OIGs conduct Quality Control Reviews (QCRs) of selected audits. Recent QCRs conducted by other Federal agency OIGs have raised concerns with the quality of audits performed pursuant to the Act. To address these concerns, the OIG community commenced the National Single Audit Sampling Project in Fiscal Year (FY) 2003 to statistically assess the quality of Single Audits, and the NSF OIG is participating in this effort. All quality control reviews under the project have concluded, and the NSF OIG is currently assisting in analyzing the results.

THEMES FOR FY 2007 AUDITS

OIG audits focus on issues of substantial concern to the Administration and NSF. To identify these issues the Office of Audit referred to: 1) recent guidance from the Directors of the Office of Science and Technology Policy and the OMB designed to improve the performance of R&D agencies, 2) the OIG's top management challenges to NSF for FY 2006, and 3) analyses of NSF awards and award recipients to assess the risk of error or mismanagement of NSF funds. These three sources yielded four major themes for the FY 2007 audits: return on investment, security and privacy, emergency preparedness, and financial accountability. The themes pertain to both programmatic and financial/administrative functions at the preaward, active-award, and closeout stages of the award cycle and to NSF's infrastructure. By addressing these themes in the FY 2007 audits, the OIG will help NSF achieve its mission and strategic goals and align them with the Administration's R&D priorities.

Return on investment includes comprehensive life-cycle analysis of projects, facilities, centers, and programs funded by NSF to ensure that performance goals and associated metrics to assess progress and final accomplishments are clearly stated at the outset; that interim and final performance is documented, analyzed, and evaluated; and that the resulting evaluations are used to guide future investments. Although the specifics of the analysis depend on whether the project is an award, program, center, or a large facility, the return on investment framework is comprehensive enough to apply to all types of investments in NSF's portfolio.

This framework includes planning, designing, selecting, constructing (if applicable), operating, managing, evaluating, and terminating projects, facilities, and programs. It also addresses the Administration's three criteria for all R&D programs -- quality, relevance, and performance. Competitive, merit-based peer review helps ensure that projects, facilities, and programs will be of high quality; alignment with Federal R&D priorities helps ensure that investments of taxpayer funds will be relevant to national goals; and measurement of accomplishments against initial goals helps ensure that performance goals will be met. The return on investment framework also addresses three of the top NSF management challenges -- merit review; award administration; and budget, cost, and performance integration.

Security includes the on-site and off-site physical and data security necessary to protect human life, physical assets, such as real property and equipment, and intangible assets, such as sensitive agency information, including personally identifiable information (PII). Privacy overlaps with security because security is a prerequisite for the privacy of PII such as social security numbers. Both security and privacy are Administration priorities, and IT security is a top NSF management challenge. Emergency preparedness includes planning for natural or man-made disasters that threaten human health or property and/or cause significant disruptions in operations. Ensuring security, protecting privacy, and adequately preparing for emergencies relate to the infrastructure section of the audit plan.

Financial accountability of NSF and its awardees is mandated by Federal requirements including the Budget and Accounting Procedures Act, the Federal Managers Financial Integrity Act, the Chief Financial Officer Act, the Federal Financial Management Improvement Act, and OMB Circulars A-123, A-110, A-21, A-122, and A-87. Annual audits of NSF's financial statements assess its compliance with laws and regulations. In addition, utilizing the OMB Circulars as criteria, other OIG audits evaluate the financial accountability and underlying internal controls in place at NSF awardees. Conducting audits to evaluate financial accountability is central to the OIG mission of promoting effectiveness, efficiency, and economy, and preventing and detecting fraud, waste, and abuse. In order to identify NSF awardees that might not meet the Federal criteria for financial accountability, the OIG risk assessment, which was used to select the audits for the FY 2007 plan, included variables such as institution type, award type, audit history, and prior NSF experience with an awardee.

SUMMARY OF PLANNED PROJECTS FOR FY 2007

1. Preaward Phase

Preaward reviews help reduce NSF's risk of award management problems at the selection stage. Ensuring that an awardee has both the programmatic and financial capability to successfully perform under the award reduces NSF's risk that funds may not be properly spent or that the project may not achieve the intended results. Before grants, contracts, and cooperative agreements are approved, preaward processes need to assess the quality of the applicant's work plans, which provide the framework for award performance and accountability and its capability to account for Federal funds. R&D agencies are required to fund a significant majority of awards through the use of competitive merit-based peer review to ensure quality. At NSF over 96 percent of awards are selected through an external and internal merit review process.

Merit Review

About 425 program officers review more than 40,000 proposals that NSF receives each year. Program officers rely on outside experts chosen from a pool of about 300,000 reviewers to evaluate proposals. NSF policy requires at least three external reviews for every award-or-decline recommendation, unless it waives this requirement. Program officers make decisions to award or decline proposals based on the experts' opinions, their own professional judgment, available funding, and the need for a balanced portfolio. Portfolio balance includes considerations such as potential contributions to math, science or engineering education and geographic, ethnic, and institutional diversity. Generally, NSF Division Directors make the final decision to approve or decline proposals.

While finding NSF's merit review process to be sound overall, the National Science Board, the NSF Advisory Panel for Government Performance and Results Act (GPRA) Performance Assessment, and an independent contractor have identified areas for improvement to ensure the quality and innovativeness of funded research. Scientific, geographical, institutional and demographic diversity of peer-review panels is critical to the quality of merit review; yet NSF does not know how diverse its reviewer pool is because only 22 percent of reviewers (FY 2005) have reported demographic information. More fundamentally, because program officers, reviewers, and principal investigators tend to come from the same academic networks, professional associations, and institutional pools, there is a risk that institutions and principal investigators outside established networks are at a competitive disadvantage in the merit-review process. For example, the 100 top-funded academic institutions have received over 70 percent of NSF awards from 2002 to 2005.

Reviewer burnout also can diminish the quality of merit review. Burnout is especially possible given the 41 percent increase in the number of proposals received since 2000. During FY 2005 approximately 41,000 reviewers served on panels, received a proposal for mail review, or both; and about 27,000 or 66 percent of these individuals had reviewed NSF proposals previously. GPRA Advisory Committees and an NSF

contractor hired to conduct an analysis of NSF's business operations have found that NSF may be overusing reviewers. The FY 2006 GRPA Advisory Committee reported that in one program a number of proposals were reviewed by only two reviewers because of the inability to recruit more reviewers with sufficient technical expertise. The Committee recommended including reviewers in NSF's workforce analysis to increase the size of NSF's pool. The NSF contractor recommended that NSF undertake targeted outreach to recruit new reviewers, and develop a module to accept online reviewer applications to expand the reviewer pool.

Additionally, in response to Congressional concerns about the effectiveness of NSF's merit review processes, the National Science Board and NSF's FY 2005 GPRA Advisory Committee assessed whether NSF's merit review supports innovative and high risk proposals. The Administration has also signaled that innovation in R&D is imperative to maintain U.S. scientific and economic competitiveness. However, NSF's Committees of Visitors have noted that funded proposals tend to be conservative, perhaps due to the need for a consensus, and that the process may disadvantage high-risk projects with potential for high returns.

The GPRA Advisory Committee recommended that innovative, high risk proposals should be better defined. They should be "clearly innovative beyond other proposals in the field," and include the possibility of "substantial risk" and "outsized returns on investment." The Committee also recommended that NSF better train program officers, who play a major role in supporting innovative proposals, to apply this definition, and should provide clear guidance to program officers that budget constraints should not influence their ability to make investments in transformative research. To examine further how NSF identifies and funds innovative projects, the National Science Board created a task force on transformative research. The task force is scheduled to release its report in 2007.

Merit review is likely to receive continued public scrutiny. The 41 percent increase in proposals between 2000 and 2005 has resulted in increasingly lower success rates (33 percent in FY 2000 and 23 percent in FY 2005). As such, increasing numbers of unsuccessful researchers may question the fairness of the process. In addition, it is unclear to what extent reviewers consider principal investigators' prior performance on other awards in their evaluations of current proposals. Adequately addressing concerns about merit review is critical to ensuring that Congress, the science and engineering communities, and the general public have confidence in this "cornerstone" of NSF's work and the Foundation's ability to independently select high quality, innovative projects.

Business, Financial, and Policy Review

NSF's Grant General Conditions place full responsibility for the conduct of an NSF award and for adherence to the award terms and conditions on the awardee institution. Therefore, before making an award NSF must ensure that these institutions

have adequate financial management and administrative systems to safeguard Federal funds. At NSF, the grants official is responsible for conducting such a preaward review.

If grants officers have concerns about a prospective awardee's capability to account for its award(s), they refer their concerns to the NSF Cost Analysis and Audit Resolution (CAAR) Branch to perform preaward financial and business reviews. In addition, awardees new to NSF are required to complete and provide a "*Financial Management Systems Questionnaire*." NSF needs to ensure that the information provided by the prospective awardee is accurate and complete.

Financial audit reports performed under OMB Circular A-133 are available on almost every NSF-funded institution. In addition, audits conducted by NSF OIG or the Government Accountability Office (GAO) may be available. These audits can assist the grants officer in making funding decisions by identifying accounting and grant administration problems. However, by not incorporating prior audit findings into its preaward reviews, NSF limits the scope of its assessments and risks funding awardees that may not have the ability to manage Federal funds

In order to address risks related to merit review and business, financial and policy review, the following audits are planned for FY 2007.

Program Area	***Assignment***	***Focus***
Preaward		**Performance**
Foundation Wide	Audit of the consideration of PI prior performance in the merit review process	Audit will assess the extent to which review panels obtain and use prior award results and accomplishments in award evaluation decisions.
Foundation Wide	Audit of NSF's preaward process	Audit will examine NSF's processes for ensuring that new awardees have adequate financial systems to manage NSF awards in accordance with Federal and NSF requirements.
Preaward		**Financial/Administrative**
Foundation Wide	Audit of non-profit foundation's financial controls over NSF grants	Audit will determine if the organization has adequate financial controls to manage NSF grants in accordance with Federal and NSF requirements and should receive continued NSF funding.

Active Award Phase

Once grants, cooperative agreements, and contracts are awarded, it is important that NSF properly manage them. While recipients of NSF funds are responsible for overseeing programmatic and financial performance, NSF needs to oversee and monitor how well recipients fulfill this responsibility. NSF must ensure that award funds lead to the results expected when the award was made and are used for intended purposes in accordance with laws and regulations. As such, NSF needs to ensure programmatic results through performance monitoring and financial and administrative compliance through post-award monitoring. NSF also needs to ensure that primary recipients effectively monitor the programmatic performance and financial and administrative compliance of their subrecipients. The risks to NSF from the inadequate monitoring of program results during the active-award phase include suboptimal research results, missed opportunities to fund other research or educational opportunities that might have been more productive, and provision of deliverables at a lower quality than expected. The risks to the Foundation from the inadequate monitoring of financial and administrative compliance include erroneous payments, non-compliance with Federal and NSF grants requirements, and undetected misuse of taxpayer funds.

Monitoring Programmatic Performance of Active Awards

NSF places the responsibility to review the programmatic progress of on-going awards on program officers. Accordingly, to execute this function effectively, program officers need adequate time, written guidance, appropriate training, and effective monitoring tools. Because program officers' primary responsibility is proposal review and award selection, they have less time for managing on-going awards. In addition, the monitoring process at NSF is divided between program staff and grants administrators. As such, program officers generally do not receive the quarterly expenditure reports filed by NSF awardee to enable them to compare expected progress with claimed costs.

Also, NSF provides limited guidance to program officers, about half of whom are non-permanent or visiting personnel, on how to oversee the programmatic performance of awardees. NSF offers no formal training to program officers on the administrative and financial requirements contained in OMB Circulars or on NSF's grant conditions. Finally, a recent audit showed that over the five-year period from May 1, 1999 to May 31, 2004, more than 45,000 or 42 percent of required annual project reports on NSF awards had not been submitted. While NSF is currently working to improve its project report tracking and monitoring, final action on this issue has not yet occurred. Without adequate time, training, guidance, and monitoring tools, program officers may not detect problems with project progress or performance on an award in time to ensure that planned program goals are met before the expiration of an award.

Monitoring Financial Status of Active Awards

NSF also faces challenges in monitoring its awardees' compliance with the financial requirements of the awards. As of March 31, 2006, there were $47.4 million of

unresolved questioned costs reported in 24 audit reports. In addition, the FY 2005 Financial Statement Audit found that NSF needed to continue to improve its post-award administration and to better monitor the financial performance of its high-risk awardees. NSF has taken a number of corrective actions, including conducting on-site evaluations at 90 of its grantee institutions and performing quarterly audits of a sample of contractor billings; however, the adequacy and effectiveness of the new procedures are still being assessed. In addition, recent audits continue to identify problems with how primary awardees manage and monitor the approximately 11 percent of NSF award funds passed through to subawardees, which can lack experience, financial systems. and training to manage their subawards. Therefore, risk remains for potential erroneous payments, non-compliance with NSF grants requirements, and undetected misuse of taxpayer funds.

In order to address risks related to the programmatic and financial performance of awards, the following audits are planned for FY 2007.

Program Area	***Assignment***	***Focus***
Active Award		**Performance**
Foundation Wide	Audit of Federally Funded Research and Development Center (FFRDC) post-retirement benefits*	Audit will examine NSF's processes for ensuring the reasonableness of FFRDC post-retirement employee benefit costs.
Foundation Wide	Audit of Science and Technology Centers (STCs)*	Audit will assess NSF's management and oversight practices for ensuring the success of the Science and Technology Centers program.
Foundation Wide	Audit of large facilities	Audit will assess the appropriateness of the procurement instruments used for awards of large facility management agreements.
Active Award		**Financial/Administrative**
Office of International Science and Engineering	Audit of U.S. Civilian R&D Foundation for the Newly Independent States of the Former Soviet Union	Audit will determine whether costs charged to NSF are allowable and in compliance with Federal grant requirements.
Foundation Wide	Audit of labor effort reporting at major universities*	Audit will examine major recipients of NSF funding for compliance with requirements related to time and effort reporting.

* Represents on-going work

Program Area	*Assignment*	*Focus*
Active Award		**Financial/Administrative**
Geosciences	Audit of University Corporation for Atmospheric Research (UCAR)*	Audit will examine internal controls associated with accounting for Federal funds, purchasing practices, and time and effort reporting.
Foundation Wide	Quality Control Reviews (QCRs)* of Single Audits	QCRs of Single Audits of two institutions will determine the quality of the audits in accordance with Government Auditing Standards and OMB Circular A-133.
Foundation Wide	Audit of NSF awards to various universities, non profits, and for-profit entities	New and continuing audits will determine whether awardees have adequate systems to safeguard and properly account for NSF funds and comply with Federal and NSF award requirements.
Foundation Wide	Audit of various NSF contracts	New and continuing audits of NSF contracts with for-profits, non-profits, and universities will determine if contractors have complied with their disclosed accounting practices, have reasonable indirect cost rates, have claimed allowable costs in accordance with Federal requirements and NSF's requirements, and have adequate accounting systems to manage NSF funds.

*Represents on-going work.

4. Close-Out Administration

Evaluating the programmatic and financial results of its research programs provides important feedback for NSF. High-level decision makers, such as the NSF Director, the NSB, OMB and Congress, need to know whether NSF funds were properly spent, and which programs are and are not achieving their goals and objectives, in order to make budget allocation decisions.

Assessing Program Performance

Awardees are required to report to NSF on the accomplishments of their projects in final project reports. Special reports unique to a given award may also be required at close-out. NSF program staff are responsible for reviewing these final reports, which are important in deciding whether a particular principal investigator will continue to receive NSF funds.

However, an OIG audit in 2004 showed that out of 43,000 required final project reports, over 26,000 reports in the last five years were either not timely or not submitted at all. Further, contrary to NSF policy that requires the submission of final project reports from principal investigators before they can receive new funding, there were 74 cases in which principal investigators who had not submitted final project reports did receive new NSF funding. In response to the audit, NSF submitted a corrective action plan to notify principal investigators and their institutions when annual and final project reports are due and overdue. However, the corrective action has not yet been completed. In addition, as of May 2006, 1,372 NSF awardees had not submitted timely final reports and one awardee institution had 131 overdue final reports. Thus, it is unclear whether NSF is effectively evaluating the results of research or is using this information to guide future programs and investments.

NSF also relies on Committees of Visitors, and more generally, Advisory Committees to assess how NSF research programs contribute to NSF's mission and goals. NSF needs to ensure the quality and completeness of these assessments and act on reported conclusions and recommendations. Additionally, the Administration has signaled that R&D funding agencies such as NSF need to develop evaluation processes for programs and facilities that include metrics to measure performance results. Addressing this evaluation methodology may require NSF to develop uniform assessment processes across its programs. If the Foundation does not successfully utilize the Administration's framework for measuring results, it risks losing funding for programs that do not demonstrate "merit, quality, importance and consistency with national priorities."

Assessing Financial Performance

Grantees are required to report on final cash disbursements during the close-out phase on a Federal Cash Transaction Report (FCTR). However, final disbursement

reporting involves inherent risks that NSF needs to manage. OIG audits continue to demonstrate that NSF grantees, including colleges and universities, vary significantly in their financial management capabilities. Also, several major universities recently settled million-dollar suits for labor overcharges to the Federal Government; and a recent OIG audit at a nationally-ranked research university found that officials approved and signed effort reports for 48 percent of its salary and wage costs charged to NSF awards without adequate evidence that the expenses were allocable to these awards.

Further, on the FCTRs awardees report only summary rather than detailed expenditure information at the budget line item level, thus making it difficult for program and grants officials to identify expenditures that are not consistent with the project's goals and objectives. Therefore, NSF must have timely and effective risk assessment, award monitoring and closeout procedures to ensure that awardees are capable of administering NSF funds and that the grant expenditures reported on the FCTRs are valid, accurate, allowable, and consistent with the project's goals and objectives. Without timely and effective award monitoring and closeout procedures, there is a risk that awardees may not be in compliance with Federal and NSF grants requirements, or that NSF may make erroneous payments or fail to detect misuse of taxpayer funds.

In addition to OIG performed audits, the OIG also performs desk reviews of A-133 audits of NSF awardees and refers the audit findings and recommendations to NSF for audit resolution and follow-up. For these A-133 audits and all OIG audits, NSF implements the requirements of OMB Circular A-50 for *Audit Followup*. The OIG works with NSF staff to resolve internal control, compliance, and questioned cost findings contained in these audits and to ensure awardees implement corrective action plans to address the audit findings. However, ensuring effective implementation of proposed corrective actions remains challenging, given resource constraints and the number of NSF awardees.

In order to address risks related to the assessment of program and financial performance of awards, the following audits are planned for FY 2007.

Close-out		**Performance**
Office of Budget, Finance and Award Management	Audit of NSF's audit resolution process*	Audit will determine whether NSF has adequate procedures and has taken effective corrective action on grantee audit report findings and recommendations.
Foundation Wide	Desk reviews of Single Audits	Auditors will perform desk reviews of A-133 audit reports on organizations for which NSF has cognizance.

*Represents on-going work.

Closeout		**Financial/Administrative**
Foundation Wide	Contract close-out audits*	Audits will determine whether contractors properly accounted for and can support costs charged to NSF awards and have complied with award requirements, including property accountability.

*****Represents on-going work

5. Infrastructure

NSF's award making and monitoring processes require a highly sophisticated infrastructure consisting of people, systems, information technology, and physical plant and equipment. For example, in order for NSF to conduct panel reviews of proposals, it must have systems in place to allow panelists to travel to NSF, seamlessly enter the buildings and find their assigned room, and even connect their laptop to NSF's computer network. Ongoing award monitoring requires a highly trained staff, which must travel to awardee locations. All phases of the award process depend upon intricate financial accounting and reporting systems, which in turn depend upon the agency's having an advanced and secure information technology substructure. An effective infrastructure is what allows the agency to accomplish its mission. Consequently, this infrastructure must operate effectively, and be protected and maintained.

For audit planning purposes, we have grouped NSF's infrastructure into five broad categories: (1) Financial Management, (2) Human Capital, (3) Physical Plant and Property, (4) Information Technology, and (5) Acquisition.

Financial Management

Improving financial management is a significant issue throughout the Federal Government. The Chief Financial Officers Act of 1990 (CFO Act), as amended, establishes the legal framework for improved Federal financial management. The CFO Act requires agencies to prepare financial statements and the OIG (or an independent public accounting firm selected by the OIG) to audit these statements.

Since FY 2002, audits of NSF's financial statements have identified a reportable condition related to the agency's post-award monitoring of grantee institutions for compliance with the financial terms and conditions of NSF's awards. More recently, the audits have identified a reportable condition related to NSF's contract monitoring. A timely and effective post-award monitoring program for all awards, including grants, cooperative agreements, and contracts, is necessary to accurately report expenditures on NSF's financial statements and to ensure that the awardees are expending their NSF funds in accordance with their award agreements and that they are making adequate progress toward achieving award goals, objectives and targets. To monitor grants and cooperative agreements, NSF promulgated *Standard Operating Guidance,* which specifies baseline and advanced post-award monitoring responsibilities within the Foundation. The adequacy and completeness of the monitoring procedures and the effectiveness of NSF's implementation of its monitoring programs are currently being assessed.

NSF is also responsible for an annual review of its accounting systems and internal controls in accordance with the *Federal Managers Financial Integrity Act* (FMFIA) of 1982. In 2004, in light of the new internal control requirements for publicly-traded organizations in the Sarbanes–Oxley Act of 2002, OMB revised Circular A-123, *Management's Responsibility for Internal Control*, to strengthen requirements for

management's assessment of internal controls over financial reporting. Appendix A of the Circular specifically requires the NSF Director to provide a separate assurance statement on the adequacy of controls over financial reporting. Because of the amount of time needed to understand the new requirements and to conduct the necessary control testing underlying the assurance statement, OMB has extended the government-wide deadline for implementation. NSF also recognizes the challenges it faces in performing this additional control testing and has requested a two-year extension from OMB. Audits of NSF's financial statements will continue to monitor NSF's implementation of the revised Circular A-123 requirements.

NSF also faces a risk in identifying the extent of its improper payments under the Improper Payments Information Act, Public Law 107-300 (the Act). The Act requires that Federal agencies provide OMB a statistically valid estimate of improper payments for all susceptible programs and activities. A statistical sample of expenditures and payments from December 31, 2003, through September 30, 2004, extrapolated that NSF had made only $1.05 million in improper payments on $4.2 billion of total expenditures and payments during the tested period. Based on this low amount, NSF has asked OMB for relief from the Act's annual reporting requirement. However, the Management Letter Report issued in connection with the FY 2005 Financial Statement Audit found that in NSF's estimate of improper payments reported to OMB, the Foundation had narrowly defined improper payments as those that are "expressly unallowable," thus excluding unreasonable or unsupported costs. Because of the limited scope of the test results, there is a risk that NSF has not identified all of its improper payments.

Additionally, agencies must ensure that their financial accounting systems provide accurate, timely information to support management decision-making, including information to assess the cost and performance of government programs and activities. However, the OIG letter on *Management Challenges for NSF in 2006* stated that NSF does not track the costs of its internal business operations. The proposed doubling of the NSF budget in 10 years increases the importance of developing a cost accounting system for administrative costs, since more Federal funding will likely increase NSF's administrative responsibilities, resulting in greater internal business costs. Without complete cost information, there is a risk that NSF may not be spending Federal funds on internal operations effectively and efficiently.

Human Capital

Since FY 2001, NSF and the OIG have identified workforce planning and training as one of NSF's top management challenges; and if NSF's budget is doubled over the next 10 years, this challenge will increase. According to NSF's five-year *Human Capital Management Plan* (December 2003), 42 percent of NSF's workforce will be eligible to retire by FY 2007. In addition, approximately 50 percent of NSF's program officers are "rotators," temporary employees who return to their home institutions or agencies after a few years at NSF.

Although visiting personnel allow NSF to keep abreast of cutting-edge research, they present a challenge to the Foundation, because frequent turnover increases the need for recruitment, hiring, processing, and training. Adding to these challenges, NSF received over 41,000 proposals in FY 2005, up 41 percent since FY 2000. During the same time period the number of program officers increased only about one percent, and the type of proposals received had become increasingly multidisciplinary and complex. In addition, program officers are responsible for monitoring over 30,000 active awards at any given time. As a result of workload requirements and high turnover, there is an increased risk that programmatic goals are not being accomplished effectively.

In 2002, NSF entered into a $10.6 million business-analysis contract with an outside consulting firm, which has assisted NSF in aligning staffing levels with anticipated future workloads, and establishing alternative career opportunities for administrative support staff. Due in part to the contractor's work, NSF received its first "green" score for human capital management on the President's Executive Branch Management Scorecard in June 2005. However, NSF acknowledges that it has remaining human capital challenges, such as the need to finalize, continually update, and implement a workforce plan.

NSF has identified continuing workforce challenges including: 1) increasing the capacity of the workforce to work effectively, for example, developing new staffing positions to relieve program officers of some of their administrative burdens; 2) meeting NSF's changing work and workload needs, for example, developing competencies to support new functional areas; 3) increasing the effectiveness of techniques and tools, for example, including panelists in the workforce plan, and planning for the possibility that NSF could be decentralized in the future. Without an adequate, current, effective workforce plan NSF risks having a workforce that is not effectively aligned with the type or amount of its workload.

NSF has also been working on its shorter-term staffing needs for each directorate. As a result of this effort, it has identified human capital challenges and thus potential risks. For example, NSF has acknowledged that it needs to hire more program officers and higher level administrative staff, address the space constraints that limit staff size, and provide better tools to manage staff more effectively. If NSF does not increase the number of program officers and higher level administrative staff, address its space constraints, or effectively manage its staff during varying times of peak demand, it risks overburdening staff and/or having a mismatch between workforce and workload.

Physical Plant and Property

Perhaps the most visible facets of NSF's infrastructure are its buildings and physical property. Thousands of employees, contractors, and visitors enter NSF's buildings each day and use the physical property contained therein. NSF must ensure that its physical environment is not only adequate to support its needs, but also safe and secure. Real and/or tangible assets in the United States, France, Japan, and China, and in

the Arctic and Antarctic as well as those at research facilities must be protected. NSF must prevent against unauthorized acquisition, use, or disposition of its assets.

Physical security for Federal office buildings has been a government-wide concern since the 1995 bombing of the Alfred P. Murrah Federal Building in Oklahoma City, Oklahoma, and has continued through the events of September 11, 2001, and recent hurricanes. In June 1995, the Department of Justice issued a report entitled *Vulnerability Assessment of Federal Facilities*, which designated security levels I through V into which Federal office buildings could be categorized and identified minimum-security standards for each of the five security levels. These standards covered perimeter, entry and interior security, and security planning. Fifty-two minimum standards were established with level I having 18 minimum standards and level V having 39 minimum standards. Examples of minimum standards include lighting with emergency power backup for all buildings (perimeter security); intrusion detection systems for building levels III through V (entry security); visitor control systems for building levels II through V (interior security); and standard armed and unarmed guard qualifications/training requirements in all buildings (security planning). In Arlington, Virginia, NSF's primary building has been assessed as a level IV and its secondary building has been assessed as a level II.

In May 1998, Presidential Decision Directive 63 was issued with the intent to eliminate any significant vulnerability to both physical and cyber attacks on the Federal Government's critical infrastructure. This Directive makes every Federal department and agency responsible for protecting its own critical physical infrastructure. However, because of the vast differences in types of Federal facilities and the variety of risks associated with each of them, there is no single approach to security that will work ideally for all buildings. For example, the General Services Administration has adopted a risk management approach to assessing the security of its buildings, which the Government Accountability Office believes is fundamental to determining security priorities and implementing appropriate solutions.

In addition, Homeland Security Presidential Initiative (HSPD)-12 requires that all agencies implement a single government-wide standard for "secure and reliable" forms of identification for all employees and for contractors with access to Federal facilities and information technology systems. The new standards-based systems are to be in place by October 27, 2006. NSF will also replace its two physical access systems (for Stafford I and Stafford II) with a single security system and provide new credentials to staff of about 1500. The risks to NSF from inadequate security over physical plant and property include potential loss of life, bodily harm, destruction of or damage to assets, and disruption of operations.

Information Technology

Information technology (IT) is critical to NSF's operations; and in its FY 2007 budget request, NSF requested $51.62 million for IT, an increase of 56.1 percent over the amount in its FY 2006 plan. The largest component of the IT request was for systems infrastructure and maintenance ($22.27 million), followed by applications maintenance

($12.55 million), which includes finance and administrative, and FastLane and legacy grants applications. Investments in infrastructure and applications maintenance are important, because inadequate IT maintenance could jeopardize NSF's operations and the fulfillment of its mission.

Other important components of IT include next-generation grants management and E-Government initiatives, for which NSF requested $8.20 million in FY 2007, an increase of 156.3 percent over the amount in its FY 2006 plan. Investment areas include integration with Grants.gov and E-Authentication, internal grants administration, and knowledge management, strategic information, and customer service systems. In addition, NSF has been selected as one of three first-round consortium leads for Grants Management Line of Business (GMLoB), and is currently identifying services it could offer to other grant-making agencies. The risks of totally electronic systems include major disruptions in operations during power outages and increased vulnerability to the loss, theft, or corruption of data and information. Risks of GMLoB include the development of applications that result in technology-driven rather than mission-driven grants management.

IT security is a high priority at NSF. The Foundation requested $5 million for IT security in its FY 2007 budget, an increase of 150 percent over the amount in its FY 2006 plan. However, the 2006 Federal Information Security Management Act (FISMA) evaluation required by the E-Government Act of 2002, found six areas in which NSF needs to improve computer security, including three areas in its U.S. Antarctic Program. Without timely, effective corrective action, these security weaknesses could significantly reduce NSF's ability to carry out its mission, and result in loss or adulteration of critical information, risks to health and safety, loss of assets, and disruption of operations.

Further, in June 2006, in the wake of losses of sensitive personal information at Federal offices such as the Department of Veteran Affairs, the OMB issued Memorandum M-06-16, which instructed all agencies to utilize a security checklist provided by the National Institute of Standards and Technology to protect remote information, and to take four additional actions, including encrypting all sensitive agency information on mobile devices. OMB also required every OIG to assess its organization's controls over sensitive information. In its evaluation the NSF OIG found that NSF had met some of the M-06-16 requirements but still needed to implement others. In October 2006, after all IGs have evaluated their agencies, two IG councils, the President's Council on Integrity and Efficiency and the Executive Council on Integrity and Efficiency, will issue a combined report on the protection of sensitive agency information.

To define current, future, and transitional enterprise architecture NSF requested $1.1 million in FY 2007, an increase of 83.3 percent over the amount in its FY 2006 plan. NSF's proposed investments should help address the GAO findings in August 2006 that NSF "has plans that do not demonstrate an awareness of the value of having and using an architecture." Development of IT programs without an architecture significantly

increases the risk of duplicative, poorly integrated systems that are ineffective and expensive to maintain.

Acquisition

Acquisition continues to be a significant process supporting all of NSF's functions, as well as its overall mission. In FY 2005, NSF obligated approximately $412 million for products and services from outside contractors, including an estimated $214 million obligated through advance payments to three contractors. Through contracts, NSF purchases IT services and software, statistical services for specialized reports, and basic business equipment such as desks, computers, and office supplies.

The FY 2005 Financial Statement Audit found that for a second year NSF did not adequately review contractors' quarterly expenditure reports for advance payments to determine if claimed expenses were accurate and allowable under the contract. As a result of inadequate review, a recent audit questioned $33.4 million claimed in advance payments. The auditors recommended that NSF periodically review a sample of quarterly expenditure reports to compare claimed expenditures with actual invoices or other supporting documentation; and in response, NSF contracted with an external auditor to review quarterly expenditure reports for three contracts.

Acquisition also involves internal purchases with their own inherent risks. For example, the use of credit cards decentralizes an agency's purchasing function, and gives purchasing authority to a greater number of staff. Decentralization also increases the risks of unauthorized purchases, excessive payments, or sub-optimal performance. In a given year, NSF cardholders make thousands of purchases worth millions of dollars with government purchase cards. Additionally, as more purchases are made electronically, the risks increase and NSF must address issues such as security, access, and authentication to ensure the integrity of the acquisition process.

In order to address risks related to infrastructure, the following audits are planned for FY 2007.

Program Area	***Assignment***	***Focus***
Infrastructure		**Performance**
Foundation Wide	Project reporting implementation audit	Audit will follow up on NSF's implementation of corrective actions taken in response to recommendations made in the *Audit of Project Reporting for NSF Awards* (OIG 05-2006).
Office of Information and Resource Management	Audit of NSF's Continuity of Operations Plan (COOP)	Audit will determine if NSF has an effective plan for carrying out essential functions during any emergency or situation that may disrupt normal agency operations.

Program Area	*Assignment*	*Focus*
Infrastructure		**Performance**
Budget, Finance and Award Management	Audit of NSF's administrative and overhead costs *	The conference report for the FY 2005 consolidated appropriations for NSF requests the NSF OIG review the portion of NSF's budget devoted to administrative and other overhead expenses.
Infrastructure		**Financial/Administrative**
Foundation Wide	Oversight of FY 2007 CFO Audit	Oversight of the audit of NSF's agency-wide financial statements, which will be performed by an independent public accounting firm under contract to the OIG. The audit is mandated under the Chief Financial Officers Act of 1990.
Foundation Wide	FY 2007 FISMA Review and FISCAM Audit	Annual evaluation of NSF's information system security program and practices as required by the Federal Information Security Management Act of 2002 (FISMA). Evaluation performed as part of the FY 2007 CFO Audit.
Foundation Wide	Audit of the Government in the Sunshine Act	The National Science Board holds six meetings a year, which are subject to the openness requirements of the Government in the Sunshine Act. This annual audit will assess the Board's compliance with the Act.

* Represents on-going work